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MACHINING CHECK—Robert M. Burden, Y-12 Plant machinist, checks the diameter of a cylindrical mirror component for a space telescope. The component, which is being prepared for Lockheed's Palo Alto Research Laboratory, was machined to surface finish accuracies of within a few millionths of an inch. The mirror is one of two made by Y-12 for the experimental program.

Y-12 fabricates laser mirrors

The Oak Ridge Y-12 Plant has machined two highly-reflective metal mirrors to be used in a rocket-launched telescope designed to study cosmic x-rays.

The mirrors will be part of a telescope to be launched into space aboard an Aries rocket later this year to study the nature and evolution of various sources of cosmic x-rays.

The fabrication work was performed for the Lockheed Corporation's Palo Alto Research Laboratory (Palo Alto, Calif.), which designed the telescope and the experiment payload.

According to Y-12 Plant product engineer Del Bender, the mirrors are made of an aluminum alloy on which the surfaces have been machined to within an accuracy of a few millionths of an inch. The mirrors are generally cylindrical in shape. One mirror is 26" in diameter at one end and 24" at the other end and is 23" long. The other mirror is 24" in diameter at its large end and 20" at the smaller end and is 18" long. The two mirrors are designed to be bolted together to form a continuous mirror assembly approximately 40" long.

The purpose of the mirror assembly is to reflect and focus x-rays onto a detection device.

The experiment is part of an international research project involving the United States, the United Kingdom and The Netherlands and is funded by the National Aeronautics and Space Administration, the United Kingdom Research Council and the European Space Agency.

NUCLEAR DIVISION NEWS

a newspaper for employees of the nuclear division • union carbide corporation



Vol. 10/No. 14 July 26, 1979

The energy advisor. . .

Editor's Note: Recently we began a series of energy conservation features which will be alternated with questions from readers to the "Energy Advisor" on conservation-related topics. The articles will be written by staff members about their own experiences or research, with the Energy Division's Merl Baker (alias the Energy Advisor) coordinating the series. Employees with questions or ideas for articles should contact their Nuclear Division News representative listed on the masthead.

QUESTION: Is there a clearinghouse or central source of information on solar energy, particularly technology available for residential use?

ANSWER: Yes. The National Solar Heating and Cooling Information Center is a clearing facility for information, domestic and foreign, on solar heating and cooling. The center was established by the Department of Housing and Urban Development and the Department of Energy to disseminate information about the practical feasibility of solar energy and to encourage the public and industry to consider solar energy systems for homes and commercial manufacturers. Write or call: Solar Heating, P.O. Box 1607, Rockville, MD 20805 / 1-800-523-2929. In addition, DOE's Solar Energy Research Institute has prepared the "Solar Energy Information Locator," a free pamphlet which lists organizations that 1) provide information to the general public, 2) provide some free service, and 3) are

primarily concerned with solar-related technology. This can be requested from SERI's southern regional center, 2300 Peachford Road, Atlanta, GA 30338 / (404) 547-4407.

QUESTION: Should driver training programs devote more attention to conservation?

ANSWER: Young drivers traditionally have been motivated strongly toward vehicle performance as a primary interest. As a result, driver education and training programs have emphasized safe driving habits as a principal concern. After safety, conservation of fuel also should have a very high priority. Much publicity has been given to the 55 mph speed limit as a conservation device. This is significant, but much more fuel is consumed in city driving than on the highways, where fuel consumption is mostly a function of speed and vehicle performance. By contrast, the driver's technique is dramatically important in city driving. In fact, a skillful driver can achieve

more miles per gallon with a relatively inefficient car in town than a careless one can with an efficient car.

QUESTION: When buying a major appliance, such as a heat pump or a water heater, how can one determine the relative energy efficiency of different makes and models? What is the most important comparison to make?

ANSWER: In at least one state, California, all energy-consuming appliances now must meet specified state efficiency standards. The National Energy Act of 1978 mandates efficient appliances, and DOE is developing specific rules.

The energy efficiency of appliances with electric heating elements—a water heater, for example—is influenced only by the energy that is lost through the thermal insulation. Gas water heaters are also affected by vent losses. The efficiency of electric motor driven appliances is affected both by the motor's performance and the adequacy of heat exchangers. For a heat pump or air conditioner, the efficiency measure is the number of BTU's of heating or cooling delivered for a kilowatt of electric input. For a refrigerator or freezer, the measure is the minimum watts of power required per cubic foot of capacity. Heat pumps are supplemented by electric resistance heat for low outdoor winter temperatures. The house should be sufficiently well insulated and the heat pump sized so that no resistance heat will be needed

(Please see page 8)

In this issue. . .

William H. Donahue, retired Y-12, keeps busy at his Powell home. See story on pages 4 and 5.

Other features:

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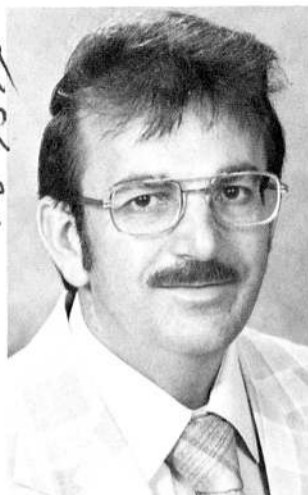


safety scoreboard

Time worked without a lost-time accident through July 19:

Y-12 Plant.....	105 Days	3,461,000 Employee-Hours
ORGDP.....	219 Days	7,020,950 Employee-Hours
ORNL.....	118 Days	2,778,704 Employee-Hours
Paducah.....	58 Days	658,000 Employee-Hours

Five promoted at Y-12 Plant



Cline



Parrett



Rogers

Five promotions have been announced at the Y-12 Plant. Jerry L. Parrett and R. Kent Dixon have been named production scheduling analysts and Esbie R. Rogers Jr. has been named a staff engineer in Product Certification; Dennis M. Nabors has been promoted to a foreman in Assembly; and Royal D. Cline a supervisor in the Plant Laboratory.

Parrett, a native of Pathfork, Ky., attended the University of Tennessee and worked as a lab technician with Abbot Laboratories before joining Union Carbide in 1966.

He and his wife, the former Frances Stoddard, live at Route 2, Sherwood Road, Powell. They have three children, Leah, Dana and Brent.

Dixon, a native of Knoxville, attended the University of Tennessee. He was with the S. H. Kress Company before joining Union Carbide in 1968.

He and his wife, the former Nancy Valentine, live at 4901 Palmwood Drive, Knoxville, with their son, Kevin.

Rogers was born in Clanton, Ala., and worked with the Martin Marietta Corporation before joining Union Carbide in 1969. He attended the University of Tennessee and Roane State Community College.

Married to the former Carol Locke, he lives at Route 1, Oakdale. They have three children, Cynthia, Bradley and Teresa.



Dixon



Nabors

Nabors, a native of Birmingham, expects to graduate from the University of Tennessee during the fall quarter. He joined Union Carbide in 1971 after serving in the U. S. Air Force.

Mrs. Nabors is the former Connie Williams, and the couple lives at 10100 Wolf Den Lane, Knoxville. They have three children, Dennis, Mark and Christie.

Cline was born in New Tazewell, and has attended the University of Tennessee. He is a graduate of the Training and Technology project in Y-12. After serving in the U. S. Army, he joined Union Carbide in 1969.

He and his wife, the former Jannis Crawford, live on North Purdue Avenue, Oak Ridge.

Two promotions told at Paducah



Miller

The promotion of Pat Karr Wooldridge has been announced at the Paducah Plant. She has been named assistant department head. Gene R. Miller has also been promoted to section supervisor in the Engineering Division.



Wooldridge

Wooldridge holds a BS and MS degree in chemistry from Murray State University, and a Ph.D. from Memphis State University. She joined Union Carbide in 1967.

Wooldridge is secretary of the Kentucky Lake Chapter of the American Chemical Society, and also serves on the governor's Council for Medical Assistance. She and her husband, Robert M., live on Sunset Avenue with her daughter, Kathleen.

Miller joined Union Carbide 20 years ago and has worked in the Maintenance Division as a draftsman, engineering designer and instrument engineer. He has a BS from South Illinois University and worked with Universal Match Corporation prior to coming to Paducah. He is president of the Instrument Society of America.

A native of Karnak, Ill., he and his wife, Sue, live on Route 4, Metropolis. They have four children, Michael, David, Scott and Gary.

Coleman appointed to ORGDP post



Coleman

Kathryn D. Coleman has been appointed Affirmative Action Coordinator at ORGDP, replacing Wayne McLaughlin who has transferred to Wage and Salary Administration. Coleman will also be the Nuclear Division News representative for ORGDP.

A native of Munich, Germany, she grew up in Laurel, Md., and holds degrees from Tusculum College and the Wharton School of the University of Pennsylvania.

She first came with Union Carbide as a student trainee in the Employee Relations Division, and returned last year after an educational leave of absence.

The Affirmative Action office is located in a trailer off K-1003, and the telephone extension is 4-9218.

Coleman lives at 213 Gum Hollow Road, Oak Ridge.

Rock concert Sunday...

Another Sunday evening concert is set for July 29, 7:30 p.m. at the Performing Arts Pavilion behind the Civic Center in Oak Ridge. The featured group will be Horizon, a rock band consisting of Philip Knight, guitar; David Sproles, bass; Kindra Albright, guitar and vocals; and Bill Allen, guitar, flute and vocals. Most of Horizon's material is original, and they have performed in the University of Tennessee area often.

The concert is presented by Friday Night Live and the Oak Ridge Recreation Teen Board. The series is sponsored by the Arts Council of Oak Ridge in cooperation with Union Carbide. The next concert will be August 5, as the Community Band will perform.

Patents granted...

To Jagdish Narayan and Rosa T. Young, both of ORNL, for "Method for Forming P-N Junctions and Solar-Cells by Laser-Beam Processing."

To Henry Inouye and Chain T. Liu, both of ORNL, for "Ductile Long Range Ordered Alloys with High Critical Ordering Temperature and Wrought Articles Fabricated Therefrom."

ORNL credit union extends membership

The ORNL Credit Union Board of Directors has amended its field of membership to include the following:

- Non-employee students who have been assigned full-time work at ORNL,
- Non-employee students who have been assigned at least one year of trainee association at the Laboratory,
- PLUS members of their immediate families.

NUCLEAR DIVISION NEWS

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Member,
INTERNATIONAL
ASSOCIATION
OF BUSINESS
COMMUNICATORS

question box. . .

If you have questions on company policy, write the editor, **Nuclear Division News** (or telephone your question in, either to the editor, or to your plant contact). Space limitations may require some editing, but pertinent subject matter will not be omitted. Your name will not be used, and you will be given a personal answer if you so desire.

Parking lot practices

QUESTION: Is there anything that can be done about cars being parked on sidewalks and on lines, and parking in the motorcycle parking areas at Bear Creek Portal? Also, can people be stopped from entering and leaving the East Portal against the traffic when roads are one-way at certain times of the day?

ANSWER: Supervision calls identifiable violations to the attention of employees, and if the individuals persist, further action is taken; fortunately this is seldom necessary. We encourage discussion at safety meetings and among employees for shared cooperation and concern of safety hazards.

Conference rooms use

QUESTION: With many of the pretty conference rooms around Y-12, why are hourly employees photographed at their retirements and 25-year celebrations in some of the ratty-looking shops?

ANSWER: The recognition of such occasions is generally in work

locations, offices, or nearby lunch rooms. If an employee would prefer having his/her photograph made in a nearby conference room, we think most supervisors would be willing to arrange this.

In view of our long-term efforts to maintain good housekeeping, we cannot agree that our shops are ratty looking. If you have any specific location in mind, please advise us or your supervisor so that we can take necessary action.

Phones at portals

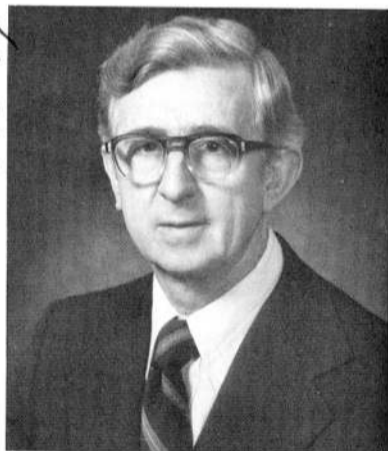
QUESTION: I recently had car trouble in the parking lot at ORGDP. To call for assistance, I had to phone the PSS office, which, in turn, called my Oak Ridge number; and the message was relayed back to me at the portal. Could an outside line not be put at the portals for cases similar to mine?

ANSWER: The telephones located outside of each portal at ORGDP were installed for the purpose of in-plant communications. Within the near future, each of these phones will be modified to provide service to Oak Ridge.

about people. . .



Jasny



Johnson

George R. Jasny, director of Engineering for the Nuclear Division, has received the 1979 Outstanding Service Award of the Tennessee Society of Professional Engineers (TSPE). He has been active many years in the area of professional development for engineers, and has been a leader and strong supporter of the WATtec conference held annually in Knoxville. The conference provides a national forum in an inter-disciplinary environment for the dissemination and exchange of information on current important national issues involving science and technology, particularly as it relates to the generation and consumption of energy. Jasny was general chairman of the conference last year.

Jasny was named engineering manager in 1966, responsible for all engineering functions at the Y-12 Plant. In 1973, he assumed the additional responsibility of manager of engineering for the uranium enrichment plant, and was appointed director of engineering for the Nuclear Division later that year.

Noah R. Johnson, a research staff member at ORNL, has been elected a Fellow of the American Physical Society for his work in nuclear spectroscopy from heavy ion induced reaction. He is in the Physics Division. The status of Fellow is conferred on selected members of the American Physical Society by the ruling of its council, following their nomination by existing Fellows. Nomination must be based on specific achievements in physical sciences.

Johnson joined Union Carbide in 1956. In 1962 he received both Guggenheim and Fulbright Foundation Fellowships to the Niels Bohr Institute in Copenhagen.

Ralph Livingston, Rufus Ritchie Carbide Research Fellows

The selection of two staff members at Oak Ridge National Laboratory as Corporate Research Fellows has been announced by Roger F. Hibbs, President of the Nuclear Division, Union Carbide Corporation.

Those selected are Ralph Livingston, leader of the photon and radiation chemistry group in the Chemistry Division, and Rufus H. Ritchie, leader of the transport and surface physics group in the Health and Safety Research Division.

In announcing the honors, Hibbs explained that designation as a Corporate Research Fellow is made by Union Carbide on a limited basis to those who have chosen research and development as a career and whose contributions have been both significant and continually high over a period of years.

Built early spectrometer

Livingston is known for his work in magnetic resonance, quadrupole resonance and microwave spectroscopy. In 1951 he built and operated a nuclear quadrupole resonance spectrometer only months after announcement of the first successful observation of the phenomenon in Germany. He also built the first sampling device for the exit air stream of the Graphite Reactor.

He is also well known for his work on the determination of nuclear moments of radioactive nuclei, electron spin resonance studies of free radicals trapped in solids, and work on labile-free radicals. His direct experimental involvement continues to be electron spin resonance, but primary emphasis is now on development of techniques for observing short-lived radicals in pyrolyzed fluids.

Came here in '45

Livingston received his bachelor's and master's degrees from the University of New Hampshire and his Ph.D. from the University of Cincinnati. He joined the Nuclear Division in Oak Ridge in 1945, after working two years as a chemist at the University of Chicago.

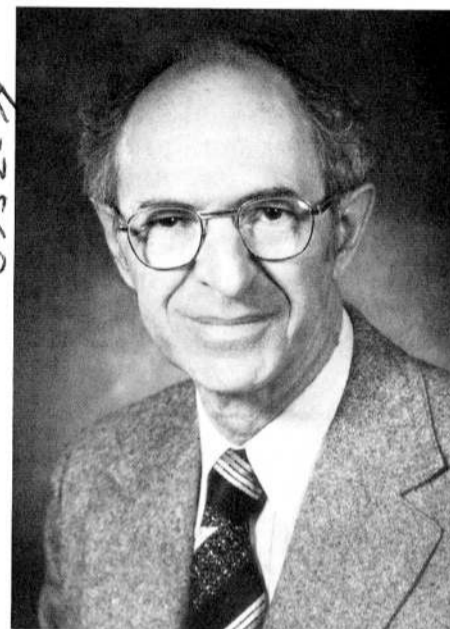
He was a Guggenheim and Fulbright scholar in 1960-1961 and is a member of several organizations, including the American Chemical Society, American Physical Society, American Association for the Advancement of Science and Sigma Xi.

Livingston and his wife, Nancy, live at 144 Westlook Circle in Oak Ridge.

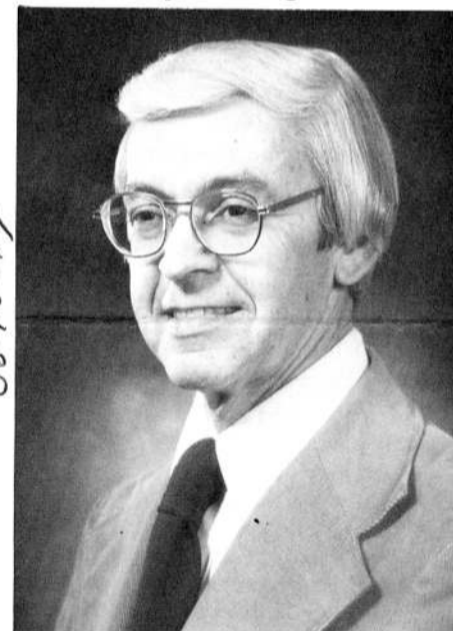
Pioneered plasmon studies

Ritchie is well known for his expertise in the fields of radiation physics and transport theory and in the theory of collective modes in condensed matter. He pioneered in theoretical study of the surface plasmon. Subsequently, surface plasmon effects have been seen in many different kinds of experiments in solid state physics. He was one of the earliest workers to apply quantum dielectric theory to study the interaction of swift charged particles with matter and the properties of surface electromagnetic waves in solids.

He received his bachelor's degree in electrical engineering and his



Ralph Livingston



Rufus H. Ritchie

master's degree in physics, both from the University of Kentucky. He received his Ph.D. in physics from the University of Tennessee. He has been a member of the staff at Oak Ridge National Laboratory since 1949 and a Ford Foundation Professor of Physics at the University of Tennessee since 1965.

Foundation professor

Ritchie has made significant contributions to the theory of energy loss in matter by charged particles, electron degradation spectra in solids, dispersion forces between particles and surfaces, and charged particle wakes in condensed matter.

Ritchie received an overseas fellowship to Churchill College, Cambridge University, England; carried out research for one year by invitation at the Institute of Physics at Aarhus University, Denmark; and was awarded a senior visiting fellowship from the Cavendish Laboratory for a year of research. He is a fellow of the American Physical Society and a member of several other professional societies.

Ritchie and his wife, Dorothy, live at 133 Normandy Road, Oak Ridge.

Enjoying the leisure life. .

Retiree finds second career "pickin' and grinnin'"

By John M. Williams

A hobby is an interest to which one gives his or her spare time. As for William H. Donahue, 71, development of a unique craft has spanned 56 years of spare time. Donahue, who retired from Y-12 in October 1969 as a foundry foreman in the Fabrication Division, not only plays the banjo, but makes them as well, along with models of ships, wagons and houses to name a few.

"I was 16 when I built that first banjo. I did it to have something to pick on, and I learned to play it," said Donahue. He estimates it takes about one year to build a banjo but confesses he works "in spurts." "It's pretty slow work, but the end result makes it all worthwhile. The engraving and carving are the most challenging parts of the procedure, but that's why it's so special," he said.

Most of Donahue's carving is done with a pocket knife with the use of various kinds of hand chisels. He takes pride in the detailed craftsmanship of his art. One banjo features an eagle carved on the backside of the wood. The detail in the bird's features is evidence of the patience, quality and long hours necessary for the final product. "I've had my eagle banjo appraised, and it's valued at \$5,000," he said.

People have inquired about buying the banjos, but he has never priced them. "I got a call once to make a banjo for Roy Clark, but I didn't want to. But now that I've thought about it, I probably would do it if they called again," said Donahue.

Most of his day is spent in the workshop next to his home. All of the unfinished guitar necks are hung around the walls, along with tools and completed projects that sit around the room. Humorous anecdotes are written on tacked-up paper. "Whenever I hear or think up a good joke, I write it down and sometimes sketch a picture to go with it," he said.

Donahue estimates he could build a banjo in about two months, if he "stays at it." He considers his "special banjo" the one in which the neck, or fingerboard, is made of abalone, a thin piece of shell found in the sea. "I make all my own banjo pieces, which includes tailpieces, armrest, bridges, the works," he said.

"I got a call once to make a banjo for Roy Clark, but I didn't want to. But now that I've thought about it, I probably would do it if they called again."

He was the first member of the family to become interested in making banjos and various model structures. An interest in banjos has resulted in Donahue's purchase and restoration of a 1929 model banjo. "I bought it from a doctor in Barbourville, Ky. I suspect it's worth a bunch," he said.



BANJO MAN—An interest in banjos resulted in the acquisition and restoration of a 1929 model banjo, purchased from a doctor in Barbourville, Ky.

He enjoys "picking" once or twice a week. Five or six friends go with Donahue weekly to play at a private residence in South Knoxville. "And every Tuesday, people come pick with me in my workshop. We move everything out, and I haven't missed a night in over three years. They come from all over. The harder it snows, the more folks come," Donahue said.

"Professionals from all over the country have played my banjos, including Don Reno from Roanoke, Va."

He attends bluegrass festivals regularly all over the country, including the "Old Time Fiddlers' Jamboree" in Smithville, Tenn. "Professionals from all over the country have played my banjos, including Don Reno, from Roanoke, Va.," he said.

Donahue also has a "unique knack" for building model structures, including covered wagons, ships and model houses. He confesses he built a scale model of a house in 1975 because he was going to build it, but found it "too expensive." The model also represents the interior's appearance.

"I make all my own banjo pieces, which includes tailpieces, armrest, bridges, the works."

About a year ago, he also built a model ship of the "Bismarck" in his spare time between banjo picking and building. Donahue seems especially proud of his scale model of a covered wagon, characteristic of the "Old West," that has been whittled from a 2x4 piece of wood. "Every screw and bolt is hand-made—even the brakes work on it. The ax, powder horn, guns and lantern have all been made with my own hands," said Donahue.

He came to Carbide in 1943. Prior to his supervisor position, he worked in patternmaking, which involved making wood patterns for models and equipment.

"I was born in the town of Ailsworth in Bryan County, Okla. It's all under water now, the result of a lake flood nearby."

Prior to joining Carbide, in the late 1930's, Donahue worked for the Tennessee Marble Company, and most noteworthy of his experience was the marble he cut for the National Gallery of Art in Washington, D.C. in 1936. "They built the machine needed, and then I cut the 11 ft. diameter marble in Knoxville. That was an exciting experience," said Donahue. Previous work also included employment with Curtis-Wright Aircraft and Fairchild Aircraft in the early 1940's.

"I was born in the town of Ailsworth in Bryan County, Okla. It's all under water now, the result of a lake flooding nearby," he said. Donahue was 27 when he married his wife, Flossie B. They've been married 40 years and have seven children (five boys, two girls) and seven grandchildren, the youngest a one-month-old girl. Donahue has lived in Powell, Tenn., for 31 years, since the building of their house in 1948.

He got the nickname "Joe" while he was in patternmaking at Y-12. "In the 1940's, when the song, 'Whatcha Know Joe,' came out, people would pass me in the shop and say, 'Whatcha know, Joe?'" said Donahue.

Donahue believes his talent is hereditary. "One of my sons who lives in Georgia designed and built his own house. He's a whiz," said Donahue.



WARMING UP—Donahue spends many leisure hours in the workshop beside his Powell home. He relaxes in between projects by playing one of his "special instruments."



BANJO "ROOTS"—The banjo-making process begins in Donahue's backyard woodpile. Most of the carving is done with a pocket knife. The pattern's detail shows the quality of his craft.

He recently finished a wooden jewelry case and is currently making wooden letters for a sign on a music barn. Other hobbies include picking the banjo, fishing and trips to their cabin in Gatlinburg.

As for his next project, Donahue is planning to build another model

ship. "I'll get some friends to scale it down for me. Until then I've got plenty to keep me busy," he said. In his spare time, he repairs violins, guitars and banjos. "I don't advertise because I stay too busy just by word of mouth," said Donahue.



"OLD WEST"—The scale model of a covered wagon is one of Donahue's prized accomplishments. All accessories for the wagon are hand-made.

anniversaries ...

Y-12 PLANT

35 YEARS

John L. Howard Jr., Casting Department; Charles R. Lively, Guard Department; Mattye B. May, Chemical Services; Verne B. Gritzner, Beta 2 Chemistry; James L. Householder, Dimensional Inspection; William K. Forrester, Engineering Division; and Marigrace W. Kirstowsky, Executive Offices.

30 YEARS

Ronald D. Smith, Operations Analysis and Long Range Planning; and Horace S. Cook, General Shops.

25 YEARS

Arthur C. Neeley, Johnathan B. Peters, Roy P. Russell, Cary A. Stanland, Charles W. Wampler, Dan H. Friar, George G. Bittner, Ralph E. Hackworth, Bradley Napier Jr., Kenneth E. Tilley, Lawrence G. Losh, Billie E. Rowland, J. E. Cheek, Paul Peterson, Clarence T. Tilley, William R. Harvey, Edward C. Pate, Joseph D. Roesler and James C. Taylor.

20 YEARS

Ruth K. Young, Bobbie R. Berrier, Stanley R. Minge, W. Donald Stinnett and J. Mont Kendrick.

ORGDP

35 YEARS

Lonnie L. Anthony Jr., Computer Sciences Division; John A. Smith, Engineering Division; Nelson H. Van Wie, Computer Sciences Division; Terry H. Robbins, U-235 Separation Department; Willie G. Smith, Chemical and General Field Maintenance; Luther H. Bailey Jr., Project Maintenance Department; Abner C. Jordan, U-235 Separation Department; James E. Bradshaw, Finance and Materials Division; Robert E. McMillan, Chemical Operations Administration; Joseph R. Collins, Chemical and General Field Maintenance; Glenn H. Shannon, Mechanical Utilities Maintenance; Gascal Jackson, U-235 Separation Department; Andres de la Garza, Classification and Information Control; Clyde A. Millsap, Mechanical Utilities Maintenance; Joseph Sawicki, Maintenance Division Administration; Browder E. Heidle, Instrument Fabrication Department; and Richard L. Poteet, Shift Superintendents.

30 YEARS

Herbert H. Young, Chemical and Barrier Maintenance.

25 YEARS

Alvin H. Marten.

20 YEARS

Jessie W. Childs Jr., Georgia G. Herron and Jerry L. Howell.

ORNL

35 YEARS

Charles D. Moak, Physics; Wallace Davis Jr., Chemical Technology; and Richard D. Simpson, Finance and Materials.

30 YEARS

Paul S. White, Biology; James S. Johnson Jr., Chemistry; and Billy P. Phillips, Operations.

25 YEARS

R. C. Bryant, John I. Federer, Golburn R. Whitaker, Harold E. Fraker, Lawrence C. Lasher and James F. Newsome.

20 YEARS

Douglas R. Hines, Tommy S. Kress, Melvin M. Martin, George M. Brown and Stanley T. Sekula.

Retiring ...



Alvin E. Parson
Tool Grinding
Y-12
25 years service



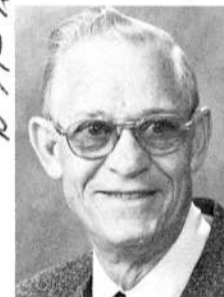
Ben H. Easterday
Utilities
Y-12
22 years service



Alvin C. Smith
Product Engineering
Y-12
26 years service



Joseph T. Wylam
Physical Testing
Y-12
12 years service



Omer E. Hatmaker
Y-12 Casting
28 years service



Robert H. Leath
Finance and Materials
ORNL
33 years service

Savings Plan-Personal Investment Account

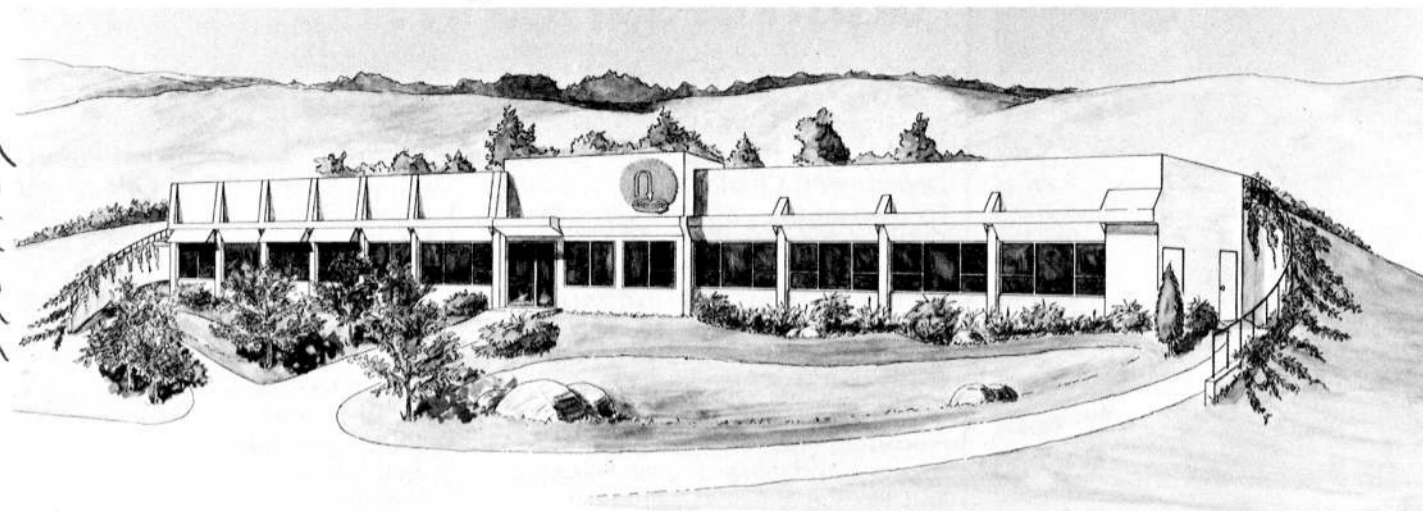
	Fixed Income Fund	UCC Stock	Equity Investment Fund
December 76	13.0553	59.2723	8.8166
December 77	14.2017	40.9096	8.0427
April 79	15.9324	38.5964	9.0100
May 79	16.0500	37.1485	8.8840
June 79	16.1669	37.3111	9.2228
		35.6488*	

*Dividend reinvestment and stock purchase plan

Note: Fixed Income Fund unit values reflect interest additions to achieve the guaranteed effective annual interest rate of 8.85% for 1978. Union Carbide stock values are the average cost of stock purchased during the month plus brokerage charges. Equity Investment Fund unit values represent the month-end market value of securities held by the Fund. The price of each unit is determined by dividing the total value of the securities by the number of units in the Fund.

Groundbreaking held for new structure

wanted. . .



Ground was broken July 10 at ORNL for a new facility, the Joint Institute for Heavy Ion Research, whose innovative design also is expected to break new ground in demonstrating the energy-conserving potential of underground structures.

The Institute, scheduled for completion next year, is a multipurpose facility to accommodate visiting scientists who will be conducting experiments at the Holifield Heavy Ion Research Facility (HHIRF).

The project is a joint venture being undertaken by ORNL and the Department of Energy in cooperation with two Tennessee institutions—The University of Tennessee and Vanderbilt University—which have pioneered in university-laboratory cooperative activities and have strong interests in heavy-ion research.

It will provide office space and living areas for national and international visitors to HHIRF, now nearing completion as the Laboratory's first major user-oriented facility for advanced research.

The one-story 4,000 square foot structure will have earth over its roof and around three sides, with daylight exposures only to the south.

Preliminary estimates indicate that this added thermal insulation

coupled with the contribution of solar energy, in a passive mode, to the building's heating and lighting will save approximately 70 percent of the energy used by a comparable above-ground structure.

Joining ORNL Director Herman Postma as speakers at the groundbreaking ceremonies were the chancellors of the two participating universities, Jack E. Reese, UT-Knoxville, and Alexander Heard, Vanderbilt; Roger F. Hibbs, President of the Nuclear Division; and James E. Leiss, associate director for high energy and nuclear physics in DOE's Office of Energy Research.

Their remarks highlighted not only the innovative features of the Institute's design but also the stimulus it and HHIRF will give to the strong

tradition of university-laboratory cooperation that has existed since the beginning of the Oak Ridge programs.

As a national center for research on nuclear structures and nuclear reactions, HHIRF will be open to scientists from universities, other laboratories, and research centers throughout the U.S.

It incorporates the Laboratory's existing heavy-ion accelerator, the Oak Ridge Isochronous Cyclotron, and a new 25-million-volt tandem electrostatic accelerator, the world's largest machine of its type, which has been constructed in a 165-foot tower that now dominates the ORNL skyline.

The Joint Institute for Heavy Ion Research will be located adjacent to the two accelerator facilities along Bethel Valley Road.

The energy-conserving features of the design have been developed as a demonstration project by the solar and special studies section of ORNL's Energy Division. The division is responsible for a DOE-sponsored program to develop more energy-efficient structures based on the application of innovative architectural principles.

ORNL

ONE or TWO CAR POOL MEMBERS from Clinton to East Portal, 8-4:30. Linda Maddox, plant phone 4-5448, home phone 457-5162.

CAR POOL MEMBERS from Emory Valley Road area, Oak Ridge, to East Portal, 8:15-5:00. George Begun, plant phone 4-4935, home phone 482-1836.

JOIN CAR POOL from Village Green in Concord to Building 6025, 8-4:30. Ben Zipperer, plant phone 4-6176, home phone 966-7212.

SIXTH CAR POOL MEMBER from vicinity of West Hills/Crestwood Hills (Knoxville) to depart from Suburban Hills Parking Lot to East Portal, 8-4:30. E. L. Fair, plant phone 4-5723, home phone 693-3211.

CAR POOL MEMBER from Walker Springs/Cedar Bluff exit areas, Knoxville. Paul Robinson, plant phone 4-4944, home phone 690-9164.

RIDERS for VAN POOL from West Knoxville to any Portal, 8-4:30. Dean Treadway, plant phone 4-6580, home phone 584-4879.

RIDE from West Hills area (Northshore Drive and Morrell Road), Knoxville, to any portal, 8-4:30 or 8:15-4:45. Harold Weber, plant phone 4-6269, home phone 588-5571.

FORM CAR POOL from Wilderness Trace/Garden Apartments/Burnham Woods area, Oak Ridge, to East Portal, 8:15-4:45. Harlan Bittner, plant phone 4-4936, home phone 483-5255.

JOIN CAR POOL from Asheville Highway/John Sevier Highway area, East Knoxville, to 7600 area, 8-4:30. Charles Harbin, plant phone 4-7163, home phone 524-7532.

Y-12

VAN POOL RIDERS from Gleason Rd. / West Town / Kingston Pike / Cedar Bluff / Mabry-Hood Rd. to any portal, 8-4:30. C. W. Greene, plant phone 4-0437; home phone 690-3762.

RIDE WANTED or JOIN CAR POOL from West Knoxville Kingston Woods area—or will meet at some central location—to Central or North Portals, 7:30 a.m. to 4 p.m. E. J. Tullos, plant extension 4-2178, home phone Knoxville 693-8899.



GROUND BREAKING—A break in the clouds allowed the official groundbreaking to be conducted on site. Performing the task, from left, are Alex Zucker, ORNL associated director for physical sciences; Herman Postma, ORNL director; Alexander Heard, chancellor, Vanderbilt University; Jack E. Reese, chancellor, University of Tennessee-Knoxville; Roger F. Hibbs, President, Nuclear Division; and James E. Leiss, associate director for high energy and nuclear physics, Office of Energy Research, DOE.



GUESTS WELCOMED—A threat of rain brought the ceremonies inside the high bay area of the new addition to the Holifield Heavy Ion Research Facility. ORNL director Herman Postma welcomed the guests and made introductions of the speakers to the employees and members of the news media.



Stress — new buzz word

by T. A. Lincoln, M.D.

Although executive stress has been around for hundreds of years, it currently is one of the "buzz" words in the suburban cocktail circuit. Every few weeks, presidents or medical directors of corporations get letters extolling the virtues of organized antistress programs. Is executive stress really "ravaging" managers like some stress treaters claim, or is it only a modest problem?

Emotional stress specifically related to work is typically caused by uncertainty, deadlines, conflicts, overwork, interpersonal relationship problems, and a sense of loss of control. In some people, it produces many unpleasant symptoms such as irritability, indecisiveness, anxiety and fatigue which can impair effectiveness. It can cause or aggravate psychophysiological disorders such as headache, indigestion, muscular tension and diarrhea. It often greatly increases the consumption of alcoholic beverages.

Eustress or healthy stress

The unpleasant aspects of stress have been overemphasized. It is stress which gives life meaning, satisfaction and thrill. Wherever there are challenges or competition, there is stress. Work satisfaction usually requires accepting some type of physical or intellectual challenge and performing well enough to get some approval or at least fulfillment. This type of stress is called eustress or normal or healthy stress. The stress which is unpleasant and handicapping is called distress.

Stress is clearly related to job performance. In an individual who is motivated to try to make work meaningful, who has ambition and who wants to do more than coast through life, stress can affect job performance both positively and negatively. In many people, a total lack of stress greatly reduces productivity. When there is little challenge, there is little achievement. Sometimes this lack of stimulation can be a cause of distress. Boredom can be debilitating.

At the other extreme, too much stimulation and too many demands, conflicts, etc., can cause distress. The harder one works, the more one worries and the less he or she seems to get done. Adequate eustress, however, is necessary to reach peak productivity. Few achievers lead placid, peaceful lives.

In a questionnaire survey conducted by Dr. Ari Kiev and Vera Kron for the American Management Association, personal job-related stress which was potentially nonproductive was uncommon. Of the 2685 respondents, 1422 classified themselves as top management and 1237 as middle management. Only three situations were reported to have occurred, on the average, more often than "sometimes" during the preceding year. They were, "heavy workload/time pressures/unrealistic deadlines, disparity between what I have to do on the job and what I would like to accomplish, and long

hours/long commuting distance." The frequency of occurrence for top and middle level management was essentially the same.

Interpersonal and organizational stress factors were likewise infrequent. The general "political climate of the organization," the "lack of feedback on job performance" and "uncertainty about the organization's or industry's future" were reported by top managers to be occasional problems.

Middle managers said that "lack of authority to make decisions that match my responsibilities" was a more common concern than "uncertainty about the organization's future."

Personal stress away from work was reported more frequently than job stress. Financial worries, problems with the children, physical injury, illness or discomforts and marital problems were the most common complaints.

Managers who successfully coped with job stress reported that analyzing stress-producing situations and deciding what was worth worrying about and what wasn't, delegating responsibility and establishing daily goals were their most successful techniques. Away from the job, talking with the spouse or a friend, engaging in physical exercise and being involved in engrossing nonwork activities were most successful.

Asset or liability

Stress can be an asset or a liability. In most cases the stresses related to the home or personal life are a greater problem than work stresses. Just too much work alone is seldom the major problem if it is being performed in a reasonably constructive atmosphere. Where inter-personal relationships, the so-called "political environment," become difficult and appear to be unresolvable, distress may be severe and even disabling.

Work and personal stress obviously need coping techniques but treating all stress as a problem is not wise. Stress can be a powerful motivator for making personal decisions or seeking professional help. Palliative dischargers or diverters of stress are useful, but their general need has probably been overemphasized. Frequently, being able to discuss one's "problems" in complete confidence with a physician or clinical psychologist will help the most. "Sharing" the burden brings relief and enables the patient to take positive action for long-range resolution of the problem.

Heat pump water heater tested

A new heat pump water heater which saves up to two-thirds of the energy used by a conventional resistance-type electric water heater will be tested in 100 homes across the country during the next 15 months.

The unit, which works much like a window air conditioner, has been developed by Energy Utilization Systems (EUS), Inc., Pittsburgh, Pa., under contract with ORNL.

U.S. customers purchase almost three million electric water heaters every year. In addition to being one of the most commonly found appliances in the home, the water heater also is among the largest energy users.

Electric models use an average of 450 kilowatt hours (KWH) each month, accounting for approximately \$20 of the customer's monthly electric bill. Overall, their energy consumption is the equivalent of 750,000 barrels of oil each day, or almost two percent of the nation's total energy use.

The new heat pump water heater is energy efficient because it obtains part of the heat required for heating water from the air. The basic components of the heater are a motor-compressor, condenser, evaporator, expansion valve, refrigerant and control system.

Energy-saver

Laboratory tests have shown that the unit can save from one-half to two-thirds the energy used by conventional resistance-type electric

water heaters depending on several variables, such as supply and delivery water temperature, climate, and location and house construction. It delivers 7,000 BTU's per hour, the equivalent of 2,000 watts, while using only 700 to 1,000 watts to run the motor-compressor. This results in a coefficient of performance of two to three.

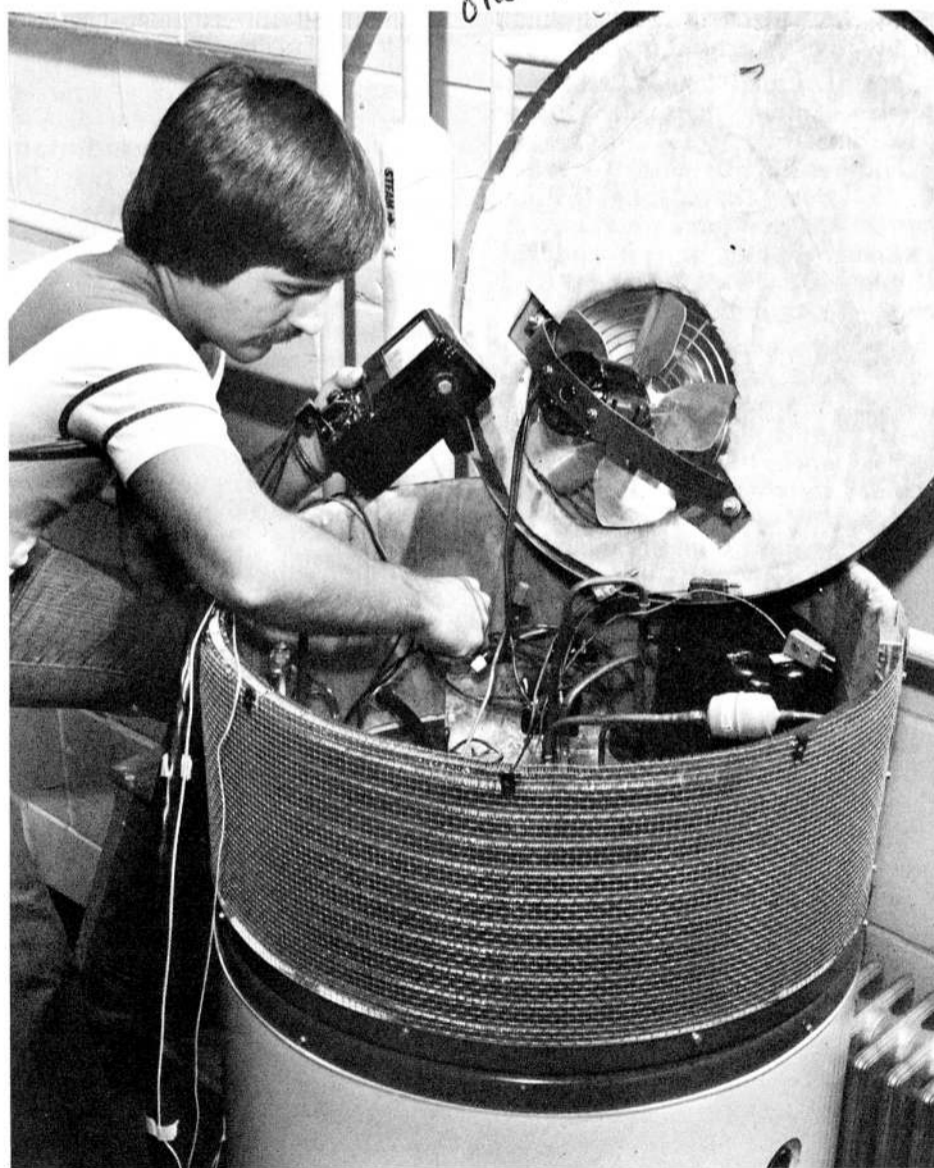
Rooms which are not heated but have waste heat (i.e., from heating duct losses) would be good locations for the heat pump water heater. In some cases the unit might be used to reduce summer air conditioning and dehumidification loads because it removes heat and moisture from the air in the area where it is installed. However, it should be located and used in a manner that does not increase the space heating load significantly. Since the peak operation of most water heaters is often during the time when demand on the utility is heaviest, the new unit may also provide a significant reduction in the utility's peak load.

Pays for itself

EUS estimates the new water heater will cost about \$250 more than a conventional electric water heater. However, with the expected savings in utility bill costs, the unit would pay for itself in many locations in two years or less.

The new unit has resulted from a two-year development project in DOE's Residential and Commercial

Please see page 8)



CHECKING IT OUT—Phil Childs, ORNL Energy Division, uses a multimeter to check connections on one of the new heat pump water heaters which was recently installed in the Energy Conservation Laboratory at the Y-12 Plant. The unit, developed by Energy Utilization Systems, Inc., under an ORNL subcontract, works like a window air conditioner to save as much as two-thirds of the energy used by a conventional resistance-type electric water heater. One-hundred of the heaters are being tested in homes across the U.S. in a joint project involving EUS, 20 electric utility companies and DOE.

Heimlich maneuver saves lives



LIFE SAVERS—At left, Edwin Hardin, a draftsman in the Engineering Division at ORGDP, reenacts how he saved his son Michael's life. Above, Noah E. Howard, Maintenance Division at ORGDP, was cited recently for administering the Heimlich maneuver to prevent a co-worker from food strangulation last January.

You're having dinner with friends. Suddenly the person next to you stops laughing at your joke. He tries to tell you something, but can't talk. Then he turns pale, then blue, and finally collapses.

A heart attack?

The fact that the victim cannot talk is the tip-off that he probably has a piece of food lodged in his windpipe and is choking. You have about four minutes to get the obstruction out, or your friend will die.

Edwin Hardin, a draftsman in the Engineering Division at ORGDP, saw his son, Michael, recently choking on a piece of hard candy. His quick thinking more than likely saved Mike's life.

Another ORGDP employee, Noah E. Howard, Maintenance Division, was cited for administering the Heimlich maneuver to a fellow employee, Jewell Beasley, as she was choking on softer food.

Howard's citation read, in part: "Your quick action and thoughtful assistance was undoubtedly instrumental in preventing dire consequences to the choking victim. Mutual concern for the safety and health of co-workers contributes to our safety effort both on and off the job."

Both Howard and Hardin learned the Heimlich maneuver in safety meetings at ORGDP.

The "hug of life," as it is often called, was developed by Dr. Henry Heimlich of Cincinnati's Jewish Hospital.

It is a simple procedure:

If it is impossible to extract the piece of food from the back of the victim's throat with your fingers, you should use this life-saving procedure.

Energy Advisor...

(Continued from page 1)

at outdoor temperatures above 25 to 30 degrees F.

Not all manufacturers print efficiency information on the name plates of appliances. However, they can supply the data if requested. The Federal Trade Commission is developing rules for mandatory energy labeling which are anticipated soon.

If the victim is standing or sitting, stand behind him and put both of your arms around him. Let his head, arms, and upper torso hang forward. Grab your fist with your other hand and place it against his abdomen slightly above the navel and below the rib cage. Press up rapidly and forcibly against his abdomen. This pushes the diaphragm upward, compresses the air in the lungs, and expels the object. Several tries may be necessary to dislodge the piece of food.

If the person is too heavy for you to hold, lay him on his back, and sit on his hips. With the heel of your left hand pressing against the back of your right hand, push forward into his abdomen just above the belt. This should also expel the object.

A second person should be prepared to remove the ejected food from the victim's mouth when it is expelled. Apply artificial respiration if the victim still has trouble breathing after the food is removed, and have him checked by a doctor immediately.

The National Safety Council reports that nearly 4,000 people choke to death each year, and the use of the Heimlich method has already prevented many potential fatalities. But the best method to use is prevention. Watch your eating habits, and don't bite off more than you can chew.

Monday Mixed League...

After five weeks of competition, two teams, the Good Luck-4 and Thunderbirds are tied for first place. June one-half game behind is the Four Eagles. The 'Birds rolled a team game of 718 to take over first place in that category. The Four Eagles took high team series with a 1970. Harold Kline claims both honors for men with 238/642.

Skeet League...

Vern Raaen, ORNL, won first place for the month of June in the Skeet League competition. Second place went to Alan VanHull, Y-12; and Bill Davy Sr., ORGDP, placed third.

Heat pump water heater tested

(Continued from page 7)

Appliance Program managed by ORNL for the DOE Office of Buildings and Community Systems. Phase 1 of the project involved the design, production and testing of prototype units by EUS.

The first prototype was built in 1977 and has been tested in the laboratory for more than a year. A special design of the unit enables retrofitting of some models of existing electric water heaters.

Varying sizes

In phase 2, EUS will produce 100 units for field tests by 20 utilities in homes across the country. Included will be major power companies and rural electric cooperatives. Each will purchase five units which they will install, monitor and maintain in homes of residential customers.

Eighty units will be new-type, 82-gallon heat pump water heaters, while 20 will be retrofit heat pumps that will be installed in existing water heating units.

EUS will provide utility representatives with training in application, installation and maintenance of the units which will be placed in basements, garages and utility rooms. In warm climate areas, a few of the heaters may be placed out-of-doors.

It is hoped that this cooperative effort by government, industry and utilities will assure that this new technology is properly introduced to the market place, thus avoiding problems of misapplication and poor installation and service.

division death...



William M. Johnson

William M. Johnson, a senior health physics technician in ORNL's Industrial Safety and Applied Health Physics Division, died July 12 at the Oak Ridge Hospital. A native of Oak Ridge, he has worked at ORNL for the past 23 years.

Survivors include his sons, Steven and David; and daughter, Tamara. Also four adopted children, Tammy Brummett, Kenny Johnson, Donna Starnes, and Patty White.

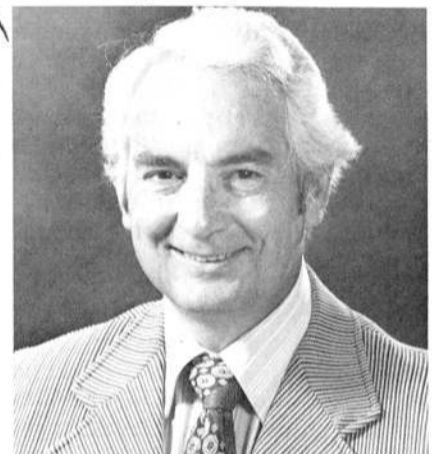
Services were held at the Weatherford Mortuary with burial in Anderson Memorial Gardens.

wanted...

Y-12

RIDE WANTED from Tacora Hills area, Clinton, to Central Portal, straight days. Ozell Wilson, plant extension 4-2416.

about people...



Napier

Bradley Napier Jr., Chemical Process Department in Y-12's Development Division, has been named national secretary-treasurer in the American Society of Certified Engineering Technicians (ASCET). The 5,000 member-strong organization defines its primary object the professional development of engineering technicians. Napier, a 25-year Union Carbide veteran, has been active in the local chapter since its beginning, serving as chapter director, secretary, three terms as president, and chairman of board for two years. He has also served as a national director. The local chapter supports a 90-member student chapter at the State Technical Institute in Knoxville.



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